

# **Appendix E**

**Plan of Operation–Exploration for Calpine Corporation and  
CPN Telephone Flat, Inc. in Glass Mountain  
Known Geothermal Resource Area**

PLAN OF OPERATION – EXPLORATION

for

CALPINE CORPORATION

and

CPN Telephone Flat, Inc.

in the

GLASS MOUNTAIN KNOWN GEOTHERMAL RESOURCE AREA  
GLASS MOUNTAIN UNIT  
2002-2003 EXPLORATION PROGRAM

GOOSENEST RANGER DISTRICT – KLAMATH NATIONAL FOREST  
DOUBLEHEAD RANGER DISTRICT – MODOC NATIONAL FOREST

SISKIYOU COUNTY, CALIFORNIA

Submitted by

CPN Telephone Flat, Inc. as Unit Operator  
10350 Socrates Mine Road  
Middletown, CA 95461

March 2002

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## INTRODUCTION

The federal geothermal leases listed in Table 1 reference their National Forest location. They are all located inside the Glass Mountain Known Geothermal Resource Area (KGRA) and Glass Mountain Geothermal Unit in Siskiyou County, California. Calpine Corporation or CPN TELEPHONE FLAT, INC., a wholly owned subsidiary of Calpine Corporation, or by a combination of these two lessees, holds each lease. In October 2001, Calpine Corporation acquired California Energy General Corporation and recently changed the name of that company to CPN Telephone Flat Inc. There was no change in the lease ownership.

Table 1

Lease	National Forest	Lessee
CA1230	Klamath	CPN TF, Inc
CA6111	Klamath	Calpine Corp.
CA21926	Klamath	Calpine Corp.
CA12371	Modoc	CPN TF, Inc
CA12372	Modoc	CPN TF, Inc
CA39729	Modoc	Calpine Corp.

CPN Telephone Flat, Inc. as the operator of the federal unit proposes to conduct geothermal exploration drilling and well flow testing during 2002 and continuing into 2003. These activities amend the Fourmile Hill Plan of Operation - Exploration (POO) submitted in September 1995 and approved by EA#CA027-EA95-11. These plans also amend POOs submitted prior to 1993 by the previous Unit operator Unocal Corporation. The plan includes the following:

- A temperature gradient hole (TGH) and a deep exploration well at 18-28 that has already been permitted for two deep wells and cleared of vegetation.
- A deep well on location 85-33 that was previously permitted as a TGH location and cleared of vegetation.
- A new TGH and deep hole location (64-27) that has not been previously permitted for a geothermal well but is in a location previously harvested for timber.

The TGHs would be drilled to a maximum depth of 6000 feet below ground surface or to a maximum temperature of 500°F to provide additional heat flow information on the resource. No fluids would be produced. The deep exploration wells would be drilled to approximately 9000 feet to confirm the existence and capability of a geothermal reservoir.

In accordance with 43CFR 3261.12, this Plan of Operation for Exploration is submitted for review and approval.

I. Project Description

A. Lease numbers and location or proposed operations

CPN Telephone Flat, Inc. (CPN) proposes a revised geothermal exploration program consisting of the drilling of one or two temperature gradient holes (TGH) and drilling two deep test wells in the locations shown in Table 2. The purpose is to further delineate the geothermal resource, either heat or fluids, located in the KGRA. The additional proposed holes and wells are listed below.

Location of Proposed Exploration Activities:

TABLE 2

TGH	Location, Township & Range	UTM Approximate	Approximate Elevation	Lease Number
64-27	NE ¼ Sec 27 T44N, R3E	N14609201.489 E615659.15	6810	CA-1230
18-28 (existing deep well location)	SW¼ Sec 28 T44N, R3E	N4608478 E613106	6640	CA-21926
DeepWell	Location		Approximate Elevation	Lease Number
64-27	NE ¼ Sec 27 T44N, R3E	N14609201.489 E615659.15	6810	CA-1230
85-33 (existing TGH location)	SE ¼, Sec 33 T44N, R3E	N4607335 E614468	7000	CA-6111

Testing of the two deep exploration wells will provide reservoir information including depth, flow rate, fluid chemistry, formation permeability, reservoir pressure and temperature and enthalpy.

B. Name and address of Lessee or Operator:

Lessee: CALPINE CORPORATION and CPN Telephone Flat, Inc.  
Operator: CPN Telephone Flat, Inc.  
10350 Socrates Mine Road  
Middletown, CA 95461  
Contact: Charlene L. Wardlow, Manager of Development Permitting  
707-431-6079

C. Biological monitoring

The following table outlines the biological surveys that have been completed or need to be completed prior to construction and or drilling operations at the respective locations. Some of the pads to be monitored cover operations to be performed this year under EA CA027-EA95-11 or the flow testing of the existing

wells 17A-6, 68-8, 31-17 and 87-13 or their use as injectors for any of the flow tests.

TABLE 3

BIOLOGICAL SURVEYS REQUIRED in 2002 (covers existing locations and proposed)							
PAD #	NSO*	GOSHAWK*	MARTEN	BATS	RAPTORS	MOLLUSCS	BOTANICAL
88-28	no	No	monitor	No	no	no	no
18-28	no	monitor	monitor	no	survey	no	no
64-27	no <sup>b</sup>	survey	monitor	roost survey	survey	no	yes
85-33	no	survey	monitor	roost survey	survey	no	no
68-8 <sup>1</sup>	c	survey	monitor	roost survey	survey	no	c
31-17 <sup>1</sup>	c	survey	monitor	roost survey	survey	no	c
87-13 <sup>1</sup>	c	survey	monitor	roost survey	survey	no	c
17A-6 <sup>1</sup>	c	survey	monitor	roost survey	survey	no	c

\* Six NSO Surveys would be conducted as early in the season as weather permits, beginning in early April with clearance by mid-June as the goal.

- a. Two early-season (as soon as ground is visible on south slopes) auditory surveys will be conducted for goshawk, with site clearance for this species per pad site as the goal.
- b. This pad site is located just west of the Modoc National Forest, within ¼ mile, and is adjacent to the Mount Hoffman Roadless Area. Thus, spotted owl surveys could be required.
- c. NSO and botanical surveys will be conducted as requested by USFS Biologist.
- 1. Existing wells that will be flow tested or used for injection.

D. Archaeological surveys and clearances

Cultural surveys will be performed on locations that have not been previously cleared of vegetation. The USFS archeologist may be available to inspect well pads before and during construction as well as a third party archeologist. Our agreement with the tribes also requires local members to perform surveys during grading activities. This will occur on 88-28, where the trees were cleared in 2001, 18-28 also cleared in 2001, 85-33 cleared and to be expanded, and 64-27 the new location.

E. Proposed operations and objectives

Following early spring biological surveys as listed in Table 3, Calpine plans to clear snow as necessary starting mid-May to begin the work as outlined for each pad listed below. Some of the work planned for this year is covered under existing Plans of Operation. This document is also being used to advise of activities planned in the Unit during 2002 and into 2003.

1. Injection into existing wells 17A-6, 87-13, 31-17 and 68-8

Calpine plans to use one or more of these wells for injection in order to return to the geothermal reservoir any fluids produced from flow tests. As described below, these flow tests will be performed at existing wells and at the new exploration well 88A-28.

In order to determine which well(s) is best suited for injection, short-term injection tests (up to 7-days) will be performed in early May, removing snow as needed. The water for these injection tests will be pumped from CPN's well at Arnica Sink and hauled to tanks at the well sites.

After selection of an injection well(s), temporary injection pipelining will be laid along one or more of the routes shown the enclosed maps. The pipeline will consist of 6- to 8-inch steel Victaulic or Drisco pipe laid alongside the road to minimize impacts to surrounding forest. If some forest routing is required, they will be laid as to avoid tree cutting and to protect any vegetation. Any road crossings will be buried beneath the roadbed as directed by USFS personnel or requirements. The temporary pipeline routes will coincide with the pipeline routes approved in EA CA027-EA95-11 for the Fourmile Hill Project's POO Figure 2 with the addition of a pipeline route to 85-33 and 64-27; and the pipeline routes shown in Figure 2.2.10 of the Telephone Flat Project EIS/EIR. A single pipeline will be used for both fresh water and geothermal fluids where the routes coincide. The temporary piping will be removed upon completion of the flow testing and drilling program.

2. Well 88A-28 – Fourmile Hill Project Area

Following early May snow removal, the construction of wellpad 88-28 including the sumps will be done through mid-June to facilitate mobilizing a rotary drilling rig to start drilling July 1 on 88A-28. A Geothermal Drilling Permit already exists for this well, but will be modified to accommodate a smaller hole program. Upon completion the well will be flow tested with the fluids flowing to the on-site sump and then pumped through temporary injection piping to one or more injection wells as described above.

Upon completion of 88A-28, the rig will be moved to either 18-28, 85-33 or 88B-28 to drill the second well. 18-28 is covered under the existing EA for exploration, 85-33 is being permitted under this plan and 88B-28 is covered under the EIS/EIR for development of the Fourmile Hill Project.

3. 18-28 Wellpad

This pad was cleared of vegetation to 360 feet by 360 feet in October 2001 in preparation to drill a deep well this year. Concurrent with the drilling of 88A-28 it is proposed to drill a TGH well on this location to evaluate heat flow prior to moving in the large rig for a deep well (permitted under EA #CA027-EA95-11). A Notice of Intent to drill the TGH is forthcoming but the well will be completed as follows:

- Drill 15-inch hole with mud to 10 to 15 feet; run 10.75-inch casing and cement annular space to surface

- Drill 9.5-inch hole with mud to 600 feet; run 7 inch casing and cement to surface
- Drill 6.25-inch hole with mud to 1200 feet; run 4.5 inch casing and cement to surface
- Core 3.8-inch hole to a maximum depth of 6000 feet or 500°F, whichever comes first. Drilling may be terminated at shallower depths depending on down hole temperatures and other geologic and drilling conditions.

Tanks would be used for holding drilling mud and cuttings and no sump would be required for this short-term operation.

Drilling would stop should the geothermal reservoir be encountered and the well plugged back. The TGH would take 30-45 days to drill.

Pending the results of the TGH, the pad would be constructed in August to prepare for the large drilling rig to move in and drill a deep well. This would take about a month to grade and build the sumps for drill cuttings and the flow test sump. It will be necessary to flatten an approximately 200-yard section of the entrance road to this pad, as it is fairly steep at the access road turn-off. A construction contractor will be used for the civil work at any sites that require dirt work.

A Geothermal Drilling Permit also exists for the deep well 18-28. Pending the results of 88A-28 the permit may be modified to a small-hole program or left as is. This well would be flow tested to 88A-28 upon completion. The pipeline would be laid through the forest along the route permitted in the EA for an injection line to pump the fluids from the on-site sump to inject into 88A-28, back into the geothermal reservoir.

#### 4. 85-33 Wellpad

Pending the status of approvals and permits for drilling a deep well on 85-33 and the results from 88A-28 and TGH 18-28, the rig would either be skidded over to drill 88B-28, which would trigger the development phase of the Fourmile Hill project, or moved to 85-33 or 18-28 to drill an exploratory well. The 85-33 location was cleared of vegetation in 2001 for a temperature gradient hole, which was not drilled as winter weather was approaching. As a result of Calpine's acquisition of the remainder of the Glass Mountain Unit in October 2001, this site is now a feasible exploration well to evaluate the resource just south of the Fourmile Hill project boundary.

The 85-33 location would be expanded to a 360 by 360 foot site with a small sump for drill cuttings and larger sump for flow testing. The flow test sump would be approximately 120 feet x 120 feet x 10 feet with a liquid holding capacity of approximately 750,000 gallons taking into account a 3-foot freeboard. The drill cuttings sump would be approximately 50 feet x 50 feet x 10 feet. Both sumps would be lined with clay or a material to meet a permeability of less than  $1 \times 10^{-6}$  cm/sec. Clay would be brought in from a registered source. The typical rig layout is shown in the attached figure. This well would be flow tested by laying a pipeline to 88A-28 through the forest.

This route was walked by biologist Frank Galea during the summer of 2001 to evaluate laying a water pipeline between these two pads instead of trucking to 85-33 as currently required by the exploration EA. It is also requested that this method for getting water to 85-33 be approved as it is less of an impact than water trucks hauling between a stand-pipe on 88-28 and the 85-33 location as they are less than ½ mile apart. This pipeline could then be used for the flow test to the 88A-28 well.

5. 64-27 Wellpad

This location is also being proposed as a TGH and deep exploration hole location. This site is also now possible as a result of the October 2001 lease acquisition. This location is east of Hwy 49 down an old logging road, which accesses an area that has been previously logged and thinned (see pictures). Depending on results this summer from other drilling operations, this pad could be cleared and constructed in late summer or early fall to drill a TGH and or a deep hole in late 2002 or in the spring of 2003.

F. Pictures of locations and drilling equipment

The following pictures show the current status of each location.

Temperature Gradient Hole Location 64-27:



Area previously logged and thinned. Approximately 100 yards off of Highway 49, .2 miles south of Jct 44N54.



Entrance road into 64-27 location from Hwy 49. Flagged with pink flagging.

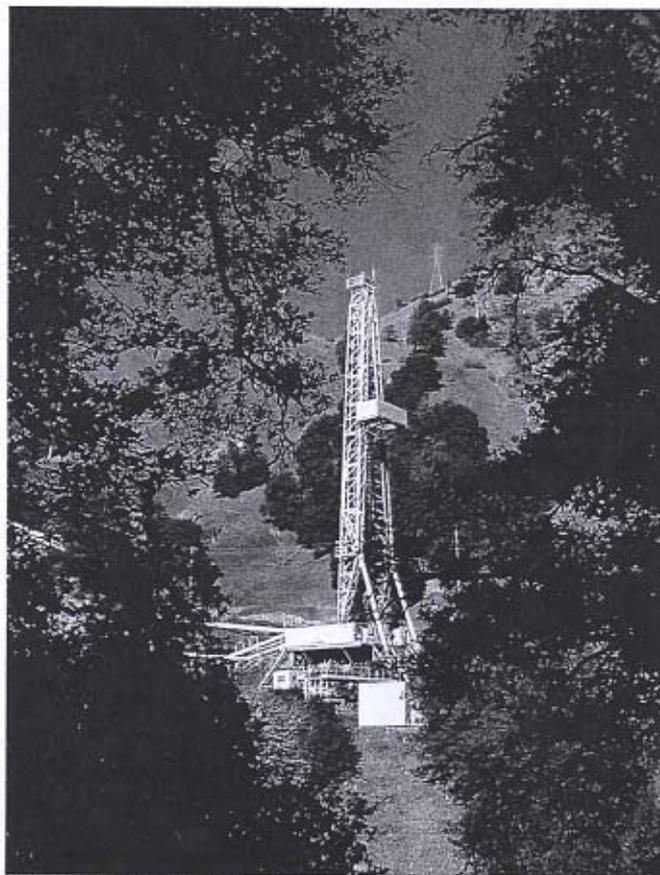
#### Deep Exploration Hole Location 85-33



Cleared to 75x150 feet in 2001 for a temperature gradient hole. Debris piles have been removed since this photo was taken on October 2, 2001.



Dynatech UDR1500 Drilling Rig at 88-28 location in September 2001.  
A similar or the same rig will be to be used for TGH holes this year.



Example of a rotary rig to be used in drilling all deep  
exploration wells during 2002.

G. Description of existing and planned access roads and pads

Existing roads will be available to access all sites. Some improvements and widening will be necessary as mentioned into 18-28 at the turn off as the road is fairly steep and will be difficult for large trucks with trailers to get up when it's icy. The 64-27 site is just east of Hwy 49 down an old skid road and will require some widening and clearing to be able to get the large trucks into the location. It is already close to 8-feet wide since logging equipment used it and will just need to be cleaned up since it hasn't been used recently. All improvements will be limited to minimum width requirements for single lane traffic and will meet USFS standard construction requirements. No import of road construction materials is currently deemed necessary, as the native road materials in the area appear adequate. No truck traffic will be allowed to access the project areas from the north by way of Lava Beds National Monument and all road usage will adhere to the existing requirements of EA CA027-EA95-11. Road use permits will be obtained from the appropriate USFS district office prior to the commencement of operations.

H. Water sources and use

Water usage during the deep well drilling will be approximately 200 barrels per day depending on the operation. This equates to approximately 9000 barrels for a 45-day well. The pipeline that will be used for flow testing 88A-28 will also be used to bring water from CPN's well at Arnica Sink. The pipelines that will be used to flow test a well at 18-28 and 85-33 respectively will also be used to transport water to those locations during drilling operations. Water could be trucked to 64-27 should a TGH be drilled first. A pipeline would be laid from 88-28 to this location along Hwy 49 should a deep well be drilled. It is also possible one of the hydrologic monitoring wells required under the Fourmile Hill development plan will be drilled at 88-28 to be used for water during drilling operations once the resource is confirmed. This would allow the removal of the pipeline through Arnica Sink to that water well. Tanks will be on-site to hold water for drilling operations.

I. Description of drilling operations

Each deep exploration well will be drilled as follows:

Drill 26" hole to 40 feet using an auger rig. Set 20-inch conductor pipe.

Drill 17-½ hole to 500 feet on mud. Set 13 3/8" casing.

Drill 12 ¼" hole to approximately 4000 feet using mud or aerated mud. Set 9 5/8" production string.

Drill 8 ½" hole to total depth of approximately 9000 feet using mud or aerated mud. Set 7" slotted liner.

If the first hole is uncommercial, the well may be plugged back and a new 8 ½" sidetrack drilled and completed with 7" slotted liner.

Each well will undergo a short production and or injection test prior to moving the rig off the location. This will be followed by a longer-term flow test of up to 30-days.

The temperature gradient locations will be approximately 75x150 feet to accommodate the TGH rig. Deep test wells require a site 360x360 feet to accommodate the rotary drilling rig and flowtest/cuttings sumps as well as all the auxiliary equipment required for this type of job scope, see the encloses. The drilling cuttings sump will be 50x50x10 feet and lined to meet Regional Water Quality Control Board (RWQCB) requirements. The liquid holding sump used for flowtesting of the well will be 120x120x10 feet or a holding capacity of 750,000 gallons also built to RWQCB requirements.

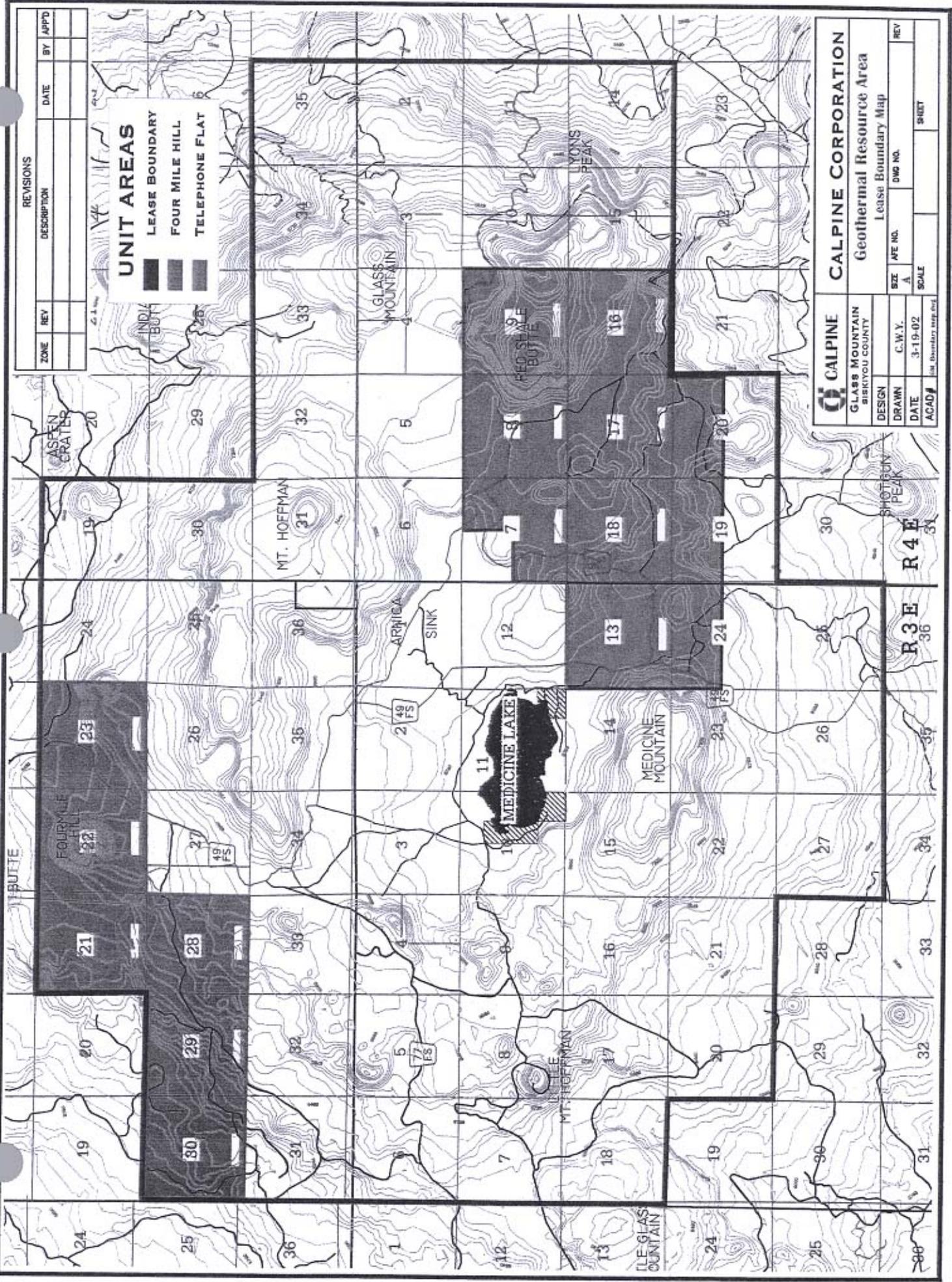
The preferred laydown area to be used for the deep hole program will be 17A-6 or 88-28 until the snow comes and then a site outside of the KGRA on private land will be used that is below snow level.

J. Description of other operations planned for 2002 – flow tests

The existing wells located in Sections 8 (68-8), 13(87-13) and 17 (31-17) of T44N, R4E, will be flowtested for up to 30-days each starting in July. Temporary injection pipelines will be run as shown in the enclosed figures. These pipeline routes were already reviewed in the Development EIR/EIS for the Telephone Flat project. The temporary pipelines will be hand laid through the forest and along either skid roads or existing roads wherever possible. Test equipment equivalent to that shown in enclosed will be used for the long-term test. The fluids will flow to the existing on-site sump and from there pumped to another well for injection back into the geothermal reservoir.

## II. MAPS AND FIGURES

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REVISIONS					
ZONE	REV	DESCRIPTION	DATE	BY	APPD

**UNIT AREAS**

- LEASE BOUNDARY
- FOUR MILE HILL
- TELEPHONE FLAT

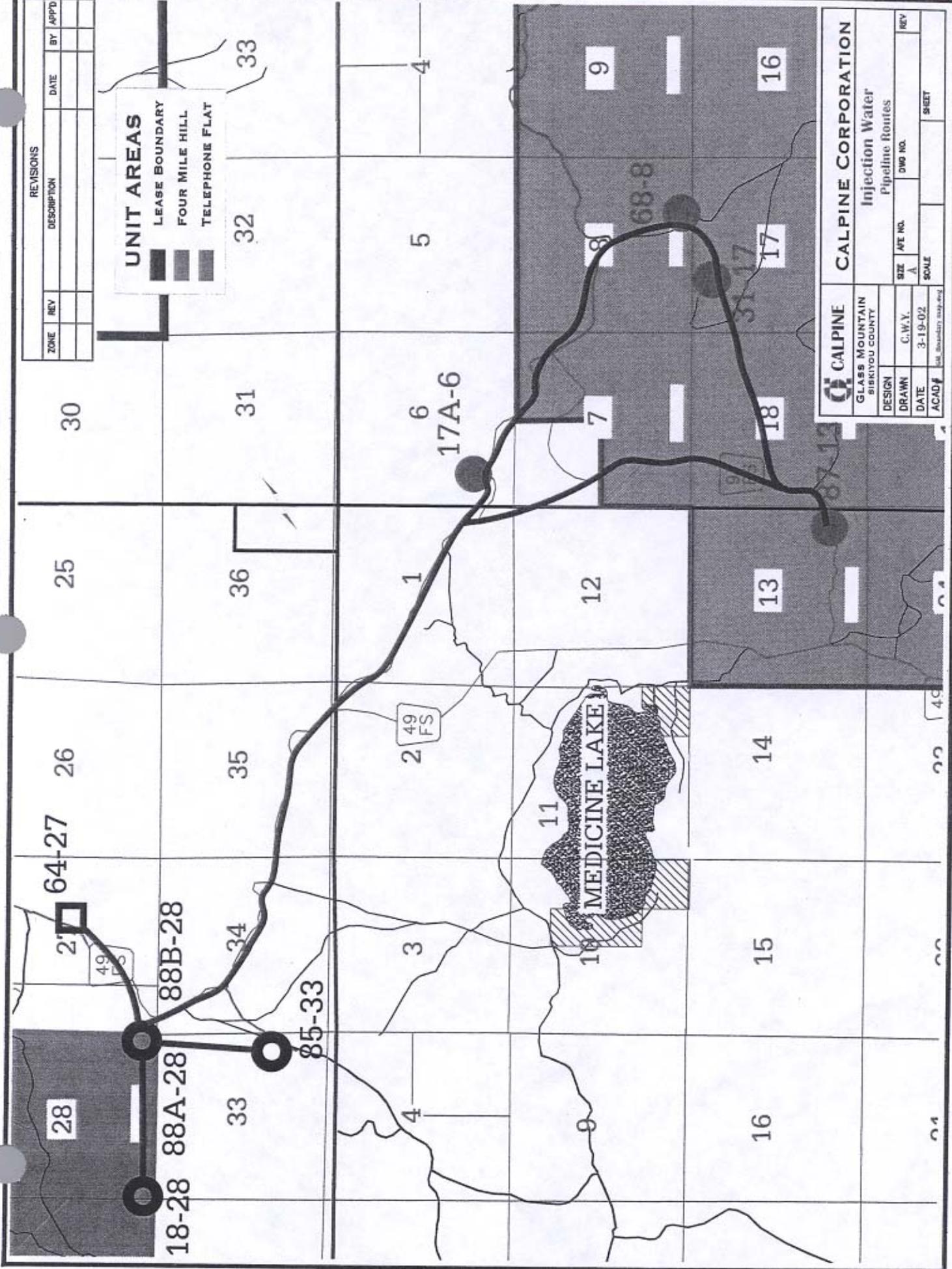
<b>CALPINE</b>		<b>CALPINE CORPORATION</b>	
GLASS MOUNTAIN ARIZONA COUNTY		Geothermal Resource Area	
Lease Boundary Map			
DESIGN	SIZE	AVE NO.	DWG NO.
DATE	C.W.Y.	A	REV
ACAD	3-19-02	SCALE	SHEET
<small>Use boundary map only</small>			



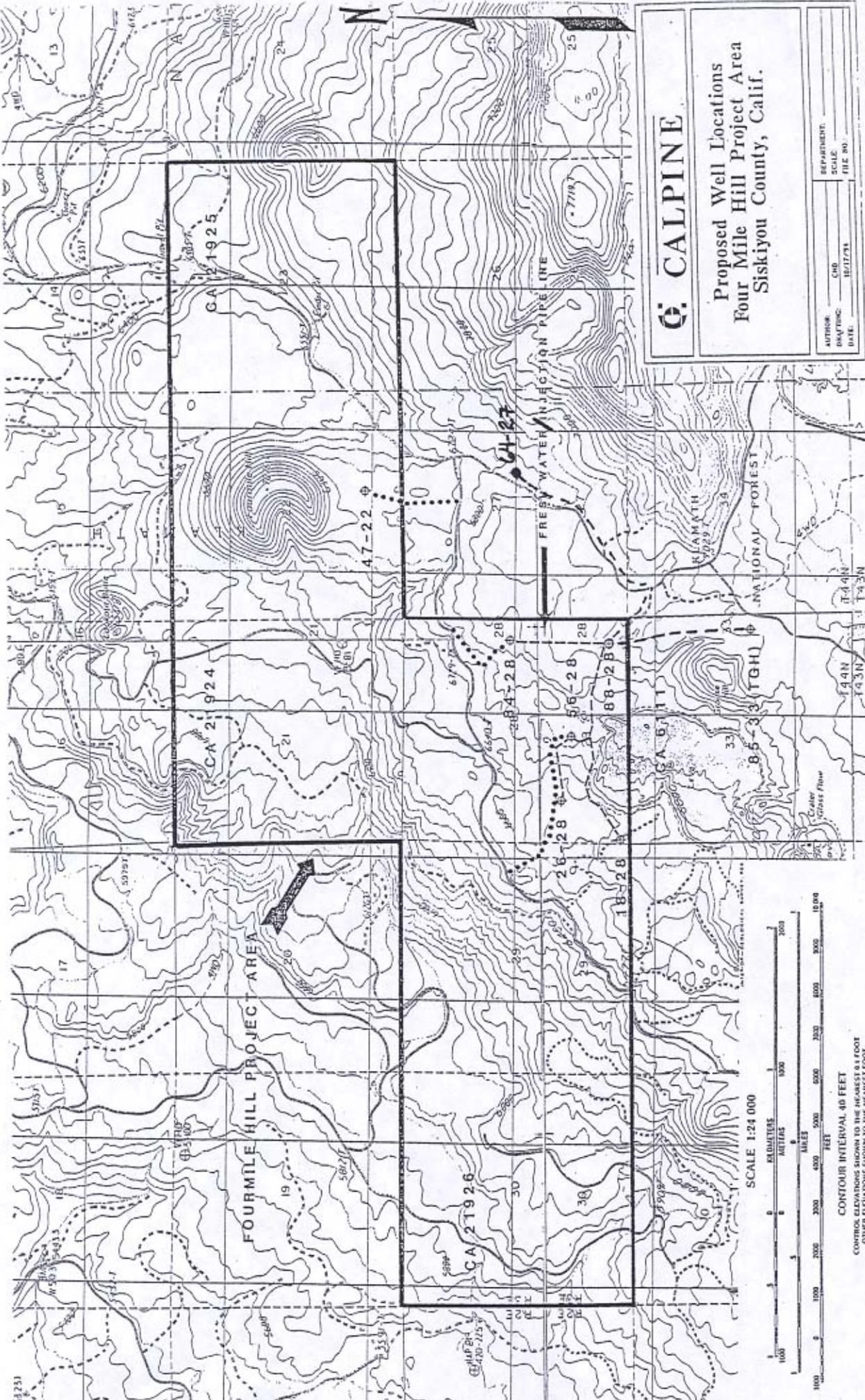
REVISIONS					
ZONE	REV	DESCRIPTION	DATE	BY	APPD

**UNIT AREAS**

- LEASE BOUNDARY
- FOUR MILE HILL
- TELEPHONE FLAT



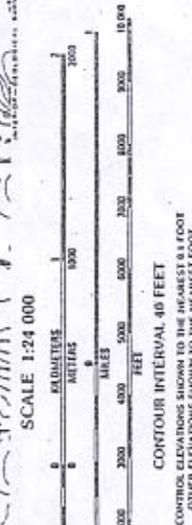
<b>CALPINE</b> GLASS MOUNTAIN SIBKIVOU COUNTY	<b>CALPINE CORPORATION</b>		
	Injection Water Pipeline Routes		
DESIGN	SIZE	A/E NO.	REV
DRAWN	A	DWG NO.	
DATE	SCALE		
ACAD			



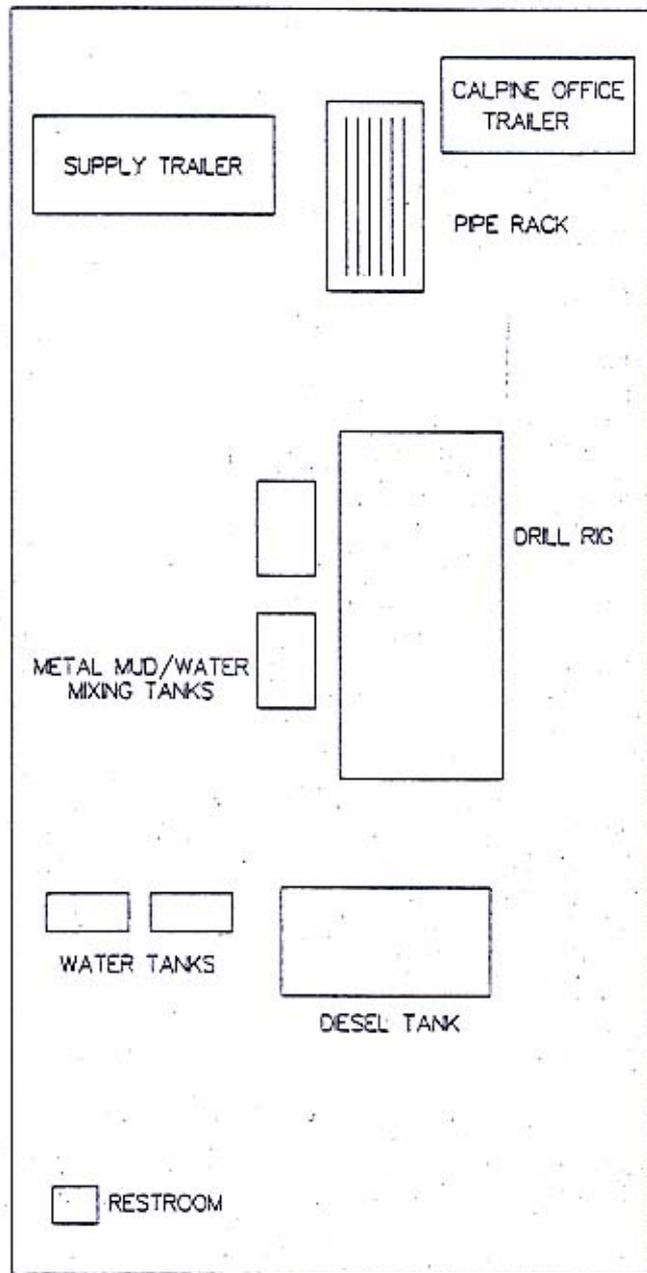
**G CALPINE**

Proposed Well Locations  
 Four Mile Hill Project Area  
 Siskiyou County, Calif.

AUTHOR:	DATE:	DEPARTMENT:
DRAWING:	SCALE:	FILE NO.:
NO.:	REVISED:	







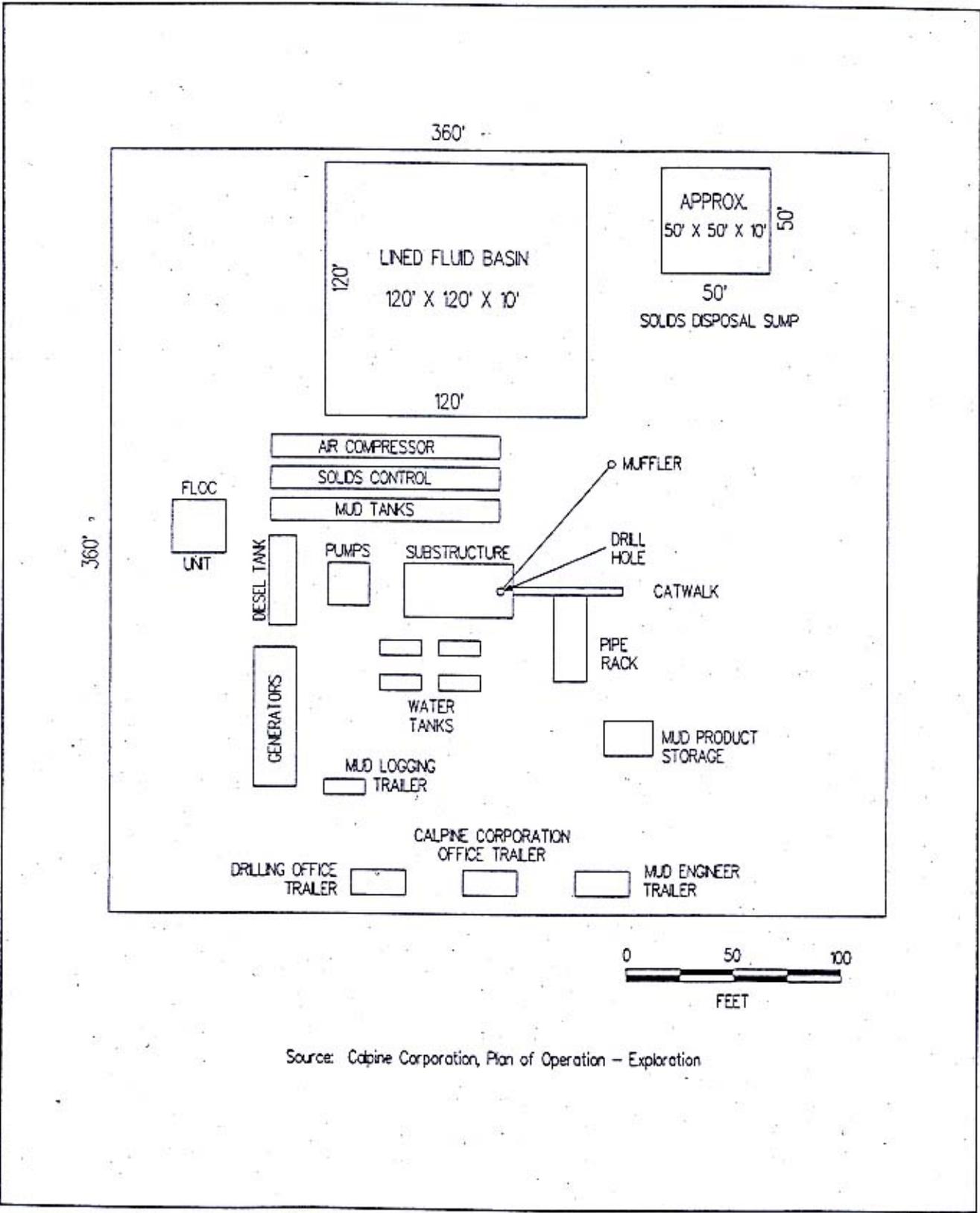
150'

75'



Calpine Corporation, Plan of Operation - Exploration

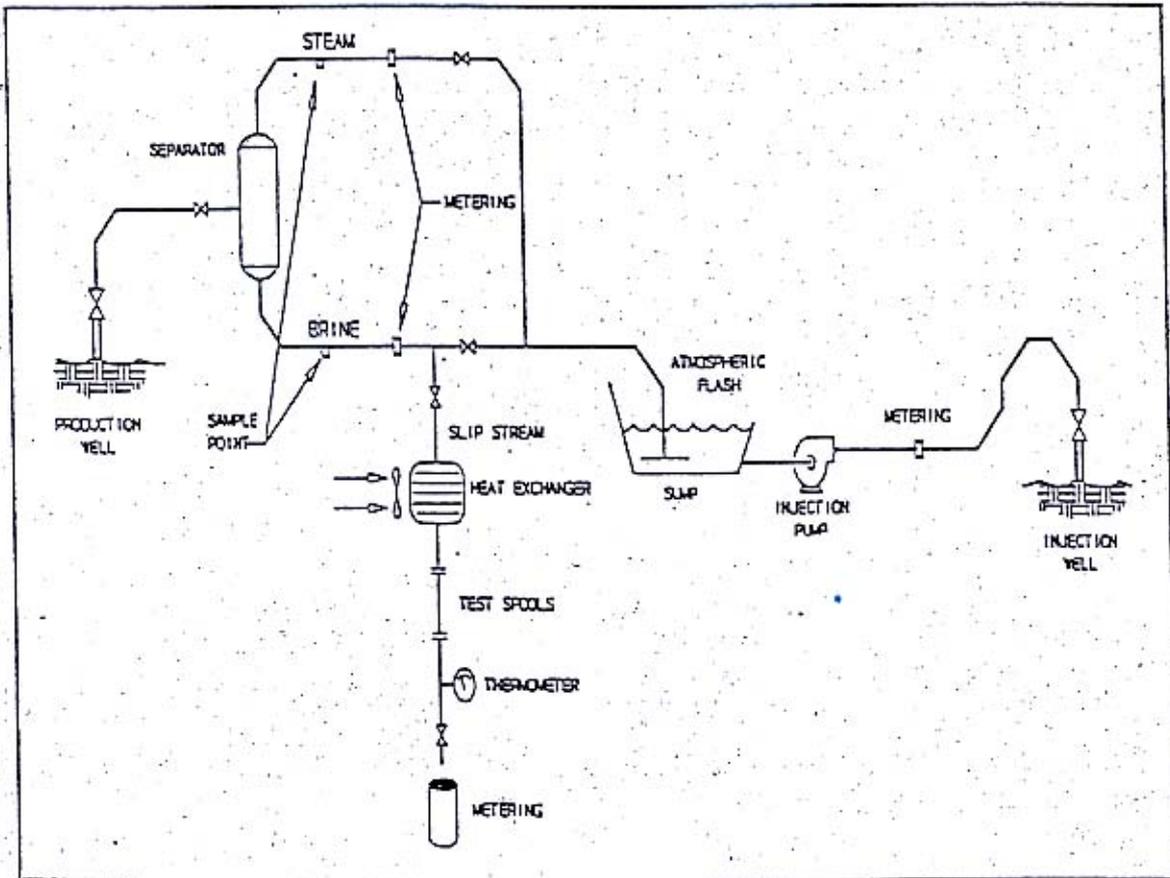
Temperature Gradient Hole - Typical Pad Layout



Source: Calpine Corporation, Plan of Operation - Exploration

Deep Test Well - Typical Pad Layout





- Well test schematic for evaluation of liquid dominated wells.

### III. ENVIRONMENTAL PROTECTION

#### A. Measures to prevent or control

All requirements of EA #CA027-EA95-11 will be met for the following resources. Federal, State and local laws, ordinances, regulations and statutes will be complied with as well as specific conditions of Geothermal Resource Orders, Geothermal Drilling Permits, air permits, waste discharge orders, road use permits or any other agency permits will be followed.

##### 1. Fire

Calpine will have all equipment on site as outlined in the attached USFS fire plan for the Klamath National Forest.

##### 2. Soil Erosion

All construction activities will be conducted to prevent unnecessary or undue degradation to the environment. Mitigation measures outlined in EA #CA027-EA95-11 will be followed for erosion control. A storm water pollution prevention plan will be submitted to the Regional Water Quality Control Board prior to start of construction activities.

##### 3. Surface and Groundwater

BLM GRO #2 outlines the casing and well completion requirements of the BLM that will protect ground water from geothermal resources if present. Additionally the Geothermal Drilling Permit will outline any further requirements needed.

The sumps will be lined with a material to meet a permeability standard of no less than  $1 \times 10^{-6}$  cm/sec to prevent infiltration of the sump fluids into shallow ground water in accordance with Regional Water Quality Control Board requirements.

##### 4. Air Emissions

Short-term effects to air quality in the immediate vicinity of the rotary drilling operations can be anticipated from the large diesel engines that are required to run the equipment. The diesel engines will be permitted by the Siskiyou County Air Pollution Control District (SCAPCD) or the California Air Resources Board and mitigated as outlined in the Authority to Construct permits.

Fugitive dust released from road and pad construction activities will also be short term and isolated to those areas. Dust can be controlled by wetting the areas with water trucks as outlined in the previous EA.

Hydrogen sulfide (H<sub>2</sub>S) gas may be contained in the geothermal fluid. It would remain entrained in the drilling mud and be neutralized by the pH of the mud system during drilling operations. The mud logger will monitor the fluids produced and drilling rig alarms on the floor are triggered at 10 ppm at which time the crew would be evacuated and the well shut-in until the safety of the area was secure. The air quality and mitigation required during drilling and flow tests has also been fully evaluated by the previous EA and the EIR/EIS. The SCAPCD will be evaluating the projects to ensure that no federal or state ambient air quality standards are exceeded. Hydrogen Sulfide abatement may or may not be needed depending on the emissions expected at a given well and the vicinity to near by receptors.

5. Noise Pollution

As addressed in the Fourmile Hill EIR/EIS Section 4.14, noise even with two rigs running is not expected to exceed the 54 dBA L<sub>eq</sub> noise compatibility standard identified in the Siskiyou County Noise Element or the Federal GRO No. 4 noise limit of 65 dBA at 0.5 miles from a location. Monitoring will be done during drilling and flow test operations at the homes at the southeast end of Medicine Lake and the North Campgrounds (Receptor Sites 2 and 1 respectively) to confirm compliance with these standards. Site and equipment specific noise control measures will be implemented if necessary to stay below these requirements.

6. Hazards to Public Health and Safety

Calpine will limit access to the drill sites where unrestricted public access could interfere with operations and constitute a public health and safety hazard. Security will be contracted if necessary.

The drill sites will be occupied 24-hours/day by Calpine personnel and or contractors during both drilling and testing operations. Federal and CalOSHA regulations will be strictly enforced at these construction sites, which require a minimum of a hardhat, eye protection and steel-toed boots.

Portable toilets will be on-site for workers as well as bottled water. A contractor who will maintain them during their use and haul them off when work has been completed will bring in the toilets.

Safety tailboards will be held every morning at both construction and drilling locations. Warning and safety signs will be posted at the entrance to all locations.

7. Damage to Wildlife and Vegetation

New locations for this year will be reviewed by a biologist and botanist to minimize impact to wildlife and vegetation. New sites were chosen in already disturbed areas as much as possible. No new road construction will be needed for this season; however, existing skid or 4-wheel drive roads

may need to be cleared or debris to make them accessible and drivable. Any sites that are abandoned will be reclaimed to USFS requirements.

8. Recreation and Timber Harvest Uses

Specific road usage, noise mitigation, air pollution control, and water quality protection measures, just to list a few, all work to ensure minimal impact to the general public that uses this area as well as timber harvest operations that will be in the vicinity during the summer and fall. Calpine will work closely with the USFS to ensure that the multi-use nature of the area is preserved. To this end we have worked diligently to work in areas of the forest that have already been disturbed by human activities.

B. Waste Disposal

All materials used in the drilling operation and wastes generated by the operation will be contained on the well site. Drilling mud and cuttings will be separated. The separated washed solids (drill cuttings) will be placed in the cuttings sump and upon completion of the well tested to verify they are non-hazardous under California Title 22 standards before being buried onsite. Auxiliary tanks will be used on site to collect any excess rig runoff and cuttings wash water. Excess cement slurry will be directed to a separate metal waste tank where it will be retarded for removal to the cuttings sump or hauled to an offsite facility.

All non-drilling solid waste including trash will be placed in waste dumpsters and periodically removed to the local landfill by the local waste company.

C. Personnel Requirements

Approximately 10-14 Calpine employees and contractors may be on a given location at any time. The drilling crews and construction contractors will not live on location but reside in a nearby community, likely in a hotel or rented house or apartment. Calpine will have a drilling superintendent, engineer, geologist and other professional staff on location at all times to supervise the ongoing operation.

The drilling superintendent, drilling contractor tool pusher, contract mud engineer, and contract mud logger will each live in a self-contained trailer on the drill pad.

D. Reclamation

As outlined in EA #CA027-EA95-11, when abandonment of either a TGH or deep well occurs and the site is no longer needed for geothermal exploration as allowed by the lease, the sites would be regraded to approximate original contours and scarified to enhance revegetation. If still available, timber and vegetation stockpiled adjacent to the site during pad construction would be scattered over the wellpad location. Similarly, any access road would be scarified and barrier rock or timber placed at the intersection of the access road and the forest road to prevent further vehicle traffic. Seedlings would be planted on the location and access road, as appropriate and in conformance with USFS site restoration requirements.

Solids in sumps on the deep hole locations would be confirmed to be nonhazardous prior to burial in place. The sump would be backfilled and graded to contour or as specified by the Regional Water Quality Control Board. If the solids would be found to be hazardous, they would be removed and hauled to an off-site disposal facility authorized to accept the material.

#### IV. ENVIRONMENTAL SETTING

##### A. Regional and Local Geology, Seismicity

This has been thoroughly described in the Fourmile Hill Geothermal Development Project Environmental Impact Statement/Environmental Impact Report. In Volume 1: Final EIS/EIR, Section 3.2, Geology and Soils, pages 3-2 through 3-13.

##### B. Hydrology

This was thoroughly described in the Fourmile Hill Geothermal Development Project EIS/EIR, Section 3.3, Hydrology, pages 3-14 through 3-36. It is also covered in USGS Open File Report 98-777. A poster showing the results of this Medicine Lake Highland study can be found at <http://caldera.wr.usgs.gov/OF98-777>.

V. EMERGENCY CONTINGENCY PLANS - APPENDICES

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## GLASS MOUNTAIN GEOTHERMAL EMERGENCY CONTINGENCY PLANS

### A. BLOWOUT CONTINGENCY PLAN

#### --PURPOSE

The Blowout Contingency Plan is provided as a guide to insure the safety of employees, contractors and, if appropriate, local residents and to insure proper notification and compliance with all laws, rules and regulations, mitigate impacts, and expedite return to normal operations.

#### --REGULATORY COMPLIANCE

Blowout prevention equipment used during drilling operations is to be kept in good operating condition at all times and tested in compliance with requirements set forth in Geothermal Regulations of the United States Department of Interior, Bureau of Land Management.

In the event of a blowout, immediate action should be taken by the Supervisor in charge to insure the safety of all employees and to control the blowout. As soon as practical an overall assessment of the situation should be made and notification given to appropriate persons as listed below. If the assessment indicates immediate danger exists to adjacent properties and/or residents, such danger should be disclosed in the notification. If relocation of equipment is required to secure the uncontrolled venting of steam, such equipment shall be relocated to the site within a period of two days providing such can be done without endangering life or property.

If a blowout occurs, all public access to the site will be restricted and if at any time the blowout becomes a hazard to life, health, and/or private property, all appropriate parties will be immediately notified.

If injuries have occurred at the site, the appropriate medical response unit listed herein should be contacted and the injured person(s) sent to the nearest medical facility equipped for appropriate treatment as quickly as possible.

The Calpine Corporation Drilling Superintendent (or Senior Calpine employee present on-site) in charge shall immediately initiate appropriate control procedures, which can vary considerably depending upon the cause of the blowout. With a non-complex blowout incident, the usual procedure to be taken at the drill rig on location could include running drill pipe into the hole to the shoe of the last string of casing and attempting to kill the well by pumping water and/or mud down the drill pipe. Once the well is killed, the drill pipe can be pulled out of the hole and the well can be kept dead by pumping water and/or mud down the kill line.

#### -- CONTROL PROCEDURES

1. The Calpine Corporation Drilling Superintendent and drill rig personnel will work with the Drilling Manager to control the blowout as quickly as possible with priority given to safety precautions.
2. The Drilling Superintendent in charge will insure that all appropriate safety practices and procedures are being followed and that the drill rig crew personnel understand the situation and are performing their assigned functions.
3. Upon completion of containment of the well, the Calpine Corporation Drilling Superintendent in charge will take appropriate steps to return the area to its normal state.

-- NOTIFICATION PROCEDURE

A. Calpine Corporation Personnel

1. Drilling Manager  
Marc Steffen           Ofc: (707) 431-6102  
                              Cell: (707) 246-7505  
                              Home: (707) 537-6808
  
2. Drilling Superintendent  
Tim Smith               Ofc: (707) 431-6967  
                              Cell: (707) 246-7503  
                              Pager: (707) 581-8408  
                              Home: (707) 894-2636
  
3. Project Geologist  
Mitch Stark             Ofc: (707) 431-6121  
                              Cell: (707) 799-8511  
                              Home: (707) 573-1219
  
4. Manager of Development Permitting  
Charlene Wardlow      Ofc: (707) 431-6079  
                              Pager: (707) 581-3226  
                              Home: (707) 763-3608

The Drilling Manager or Superintendent or Project Geologist in turn will notify:

1. Glass Mountain Program Manager  
John Miller             Ofc: (408) 794-2530  
                              Cell: (408) 472-3360  
  
                              and
  
2. Vice President – Geothermal Resources  
W.T. Box, Jr            Ofc: (707) 431-6106  
(Tom)                    Cell: (707) 483-2453  
                              Home: (707) 823-1678

The Development Permitting Manager will contact the regulatory agencies unless radio/phone contact from the field to this Manager is not possible in which case the Senior on-site Calpine employee will contact the regulatory agencies personally.

**911**

-- Regulatory Agencies

1. U.S. Forest Service
  - (a) Modoc National Forest  
Doublehead Ranger District Office: (530) 667 –2246  
Mr. Bernie Weisgerber, District Ranger  
Mr. Brad Reed, Resource Officer
  
  - (b) Klamath National Forest  
Gooseneck Ranger District Office: (530) 398-5771  
Tom Farmer, District Ranger  
Mr. Jim Stout, Resource Officer

- (c) Shasta Trinity National Forest  
McCloud Ranger District Office (530) 964-2938  
Bob Hammond, District Ranger  
Peter Van Susteren
- 2. Bureau of Land Management
  - (a) Alturas Area Office: (530) 233-4666  
Tim Burke, Area Manager
  - (b) Ukiah District Office: (707) 468-4052  
Rich Estabrook, Drilling Engineer
- 2. California Regional Water Quality Control Board
  - (a) North Coast Region  
Miguel Vigicante Santa Rosa, CA (707) 576-2220
  - (b) Central Coast Region  
Phillip Woodward, Redding, CA (530) 224-4853
- 4. Siskiyou County APCD
  - (a) Eldon Beck/Bill Stephans  
Air Pollution Control Office: (530) 841-4029

**B. ACCIDENT AND INJURY CONTINGENCY PLAN**

-- PURPOSE

Calpine Corporation field personnel on daily work assignments make every effort to prevent injuries or other emergency situations from occurring in their area of operations. If a medical emergency does occur, personnel have been trained in first aid procedures to provide interim treatment until additional assistance can be obtained. In the event an extreme medical emergency should occur, it is possible that evacuation by ambulance or helicopter may be necessary.

Information and procedures outlined in this plan apply to all Calpine Corporation employees working in field locations. All contractor employees shall be covered by a similar plan. The contractor will be responsible for making arrangements for emergency services and to have trained first aid personnel as required by Construction Safety Order 1512 (Title 8 California Code of Regulations, Subchapter 4, Article 3).

Due to the remote location in the Glass Mountain area, emergency medical assistance is limited. Because quick thinking and action are crucial in providing aid to an injured person, the following guidelines were designed to provide professional medical care for the injured person(s) as soon as possible.

-- PROCEDURE TO REQUEST ASSISTANCE

Should serious personal injury or illness occur it should be reported to the appropriate supervisor. The person reporting the injury should try to provide as much information as possible.

The following procedure is to be carried out by any person reporting an emergency requiring medical assistance.

1. Administer first aid. Do not move injured unless necessary to prevent further injury.
2. Contact or request contact be made to the U.S. Forest Service dispatcher in Alturas at **(530) 233-2379**. Request emergency medical assistance. If telephone contact cannot be made, radio communication may be provided at the Medicine Lake Guard Station.
3. Identify yourself and phone or radio you are calling from.
4. Give location of victim and nature of injury/illness. State if more than one person is injured/ill. Provide as much information as possible.
5. Assign someone to stay at or near radio unit for purpose of relaying messages until help arrives.
6. If not already done, contact immediate Supervisor.

Depending on the nature of the injury or illness and due to the remote location of the Glass Mountain area, evacuation by helicopter is a distinct possibility. If medical personnel order helicopter evacuation, the following helicopter safety procedures should be followed:

If a paramedic orders helicopter evacuation, keep helicopter-landing site clear of vehicles and unnecessary persons upon approach of helicopter (first sight of sound):

a. Daylight Landing Procedure

- (1) Stand upwind from the landing site with your back to the wind. After the pilot has spotted you, he will land directly in front of you.
- (2) Ensure landing area is clear and unobstructed.
- (3) Shield victim and self from dust and flying debris during landing. Use safety goggles if possible.
- (4) Stay clear of rotor blades. Take instruction from pilot/crewman.

b. Nighttime Landing Procedure

- (1) Park vehicle with headlights on landing area and tail lights toward wind. Flash headlights to attract helicopter. Illuminate landing hazards (wires, poles, trees, etc.) with flashlight or spotlight if possible. Put headlights on steady (low beam) when helicopter has landing area in sight (unless signaled otherwise by pilot).
- (2) Ensure landing area is clear and unobstructed.
- (3) Shield victim and self from dust and flying debris during landing. Wear safety goggles if possible.
- (4) Stay clear of rotor blades – take instructions from pilot/crewman.

c. Helicopter Safety Rules

- (1) Stay clear of rear of helicopter; always approach from front. Two extreme hazards exist:
  1. Tail rotor

2. Jet exhaust at 600°F
- (2) Do not approach helicopter while engine is running without permission, signal, or instruction from the pilot or observer. Approach the helicopter from the front to retain visual contact with the pilot.
- (3) Give the helicopter the maximum amount of space in which to maneuver. Be aware that when the prop is in a neutral position, it will tend to tilt forward and can be a possible hazard.
- (4) Protect yourself with goggles and gloves when setting off flares. Flares can spark and “spit” hot materials.
- (5) When helping to load a patient into the helicopter, take your orders from either the pilot or paramedic.

**C. EMERGENCY RESPONDERS AND TELEPHONE NUMBERS**

In the event of injuries that occur in connection with a Calpine Corporation operation, Calpine Corporation procedures will be followed, with specific and immediate attention given to proper air and/or ground transportation to a medical facility as required.

Emergency personnel dispatch for any emergency can be made through the U.S. Forest Service Dispatcher (Alturas). If a telephone contact cannot be made, the Medicine Lake Guard Station may provide radio communication.

Ambulance Service

Ground – Mt. Shasta Ambulance Service  
Mt. Shasta, CA (530) 926-3420

Hospital

Mercy Medical Center  
914 Pine Street  
Mt. Shasta, CA (530) 926-6111

Mercy Medical Center  
Redding, CA (530) 225-6000

Emergency Personnel and Telephone Numbers

U.S. Forest Service Dispatcher Alturas (530) 233-2379  
(24-hour air ambulance available on request)

Medical

Tulelake Ambulance Service (24-hour)	Tulelake	(530) 667-2234
Mt. Shasta Ambulance Service	Mt. Shasta	(530) 926-3420

Fire

Tulelake Ranger Station	Tulelake	(530) 667-2246
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Law Enforcement

Siskiyou County Sheriff	Yreka	(530) 842-4141
	McCloud	(530) 964-2394

Modoc County sheriff	Alturas	(530) 233-4416
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California Highway Patrol	Dial	911
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U.S. Forest Service Representatives

U.S. Forest Service Modoc National Forest Brad Reed, Resource Officer		(530) 667-2246
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Klamath National Forest Jim Stout, Resource Officer	McDoel	(530) 398-5771
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Shasta Trinity National Forest Bob Hammond, District Ranger		(530) 964-2184
--	--	----------------

Calpine Corporation

Mitch Stark, Project Geologist	Ofc.	(707) 431-6121
	Cell	(707) 799-8511
	Home	(707) 573-1219

Marc Steffen, Drilling Manager	Ofc	(707) 431-6102
	Cell	(707) 246-7505
	Home	(707) 537-6808

Charlene Wardlow, Development Permitting Manager	Ofc	(707) 431-6079
	Pager	(707) 581-3226
	Home	(707) 763-3608

John Miller, Program Manager	Ofc.	(408) 794-2530
	Cell	(408) 472-3360

**D. SPILL RESPONSE**

(Plan for Spill Containment, Cleanup and Abatement)

A. Definitions

For this plan, a **minor** spill is any spill, which is fully containable without the potential to endanger the watershed. A minor spill becomes major if it is on a county or state roadway.

A **major** spill is any spill, which is not fully containable or has the potential to endanger or has entered the watershed.

A watercourse is defined as any flowing or standing water, or any seasonally dry channel or bed where there could reasonably be a flow during flooding. A drilling sump is not a watercourse.

The following procedures (Emergency Response and Action Plan are NOT to be mistaken with "EMERGENCY RESPONSE" measure discussed under 40 CFR 1910.120) are in response to incidental releases and although they may involve outside responders, the incidents described are not within the scope of 40 CFR 1910.120 standard i.e. imminent danger of fire or explosion.

The person responsible for the operation which results in an accidental discharge or spill or the first person to arrive at the scene of an accidental discharge or spill will make an immediate investigation, take action required for control of the source and/or temporary containment and immediately notify the supervisor on duty of the spill incident. The supervisor on duty will serve as the emergency coordinator and determine the probability for the spill to contaminate surface drainage and immediately take the following action:

B. Procedures-Containable Spill

The Emergency Coordinator responsible for the area in which the incident occurs will assess the accidental discharge or spill, and if the spill is fully containable without the potential to endanger the watershed, will proceed to call out company/contract personnel as required and direct and supervise a complete cleanup and return to normal operations. However, if the spill is fully containable but on state or county road the spill is considered major and the Notification Procedures and Responsibilities listed under **Section E** must be followed in addition to the following clean up guidelines.

1. Call out company employees and/or contractors and equipment necessary to assure complete containment and cleanup of the spill.
2. Call out vacuum trucks as required.
3. Collect sample of spill source if the material is unknown (one-1 liter bottle and one-5 gallon container).

C. Procedures-Uncontainable Spill

If the spill is not fully containable or has the potential to endanger or has entered the watershed, the responsible Emergency Coordinator will take the following actions to curtail, contain and cleanup the spill and immediately notify the following listed agency and personnel:

1. Follow notification procedures outlined in Notification procedures in Section F and Section 3 (USFS and BLM responders). Manager of Development Permitting will call the Regional Water Quality Control Board and OES is required.
2. Call out and direct company or contract employees to man heavy equipment, or do other work applicable for control and cleanup of spill.
3. Collect sample of spill source (use spill kit for correct size).
4. Collect sample in the affected surface stream at a point upstream from the area influenced by the spill as soon after the spill as possible.
5. Collect in the affected surface stream within the zone influenced by the spill as soon after the spill as possible.

6. As the zone proceeds downstream, collect samples once each six hours and continue as long as the spill can be traced but not to exceed four samples unless given further instruction.

Possible sampling locations within this category are to be based on site-specific circumstances and judgment of the on-site Calpine supervisor. Sample collection points are to be identified on a map and visual observations of the collection area are to be recorded and submitted with samples. Water samples along with visual observations and map to identify sample locations are to be delivered to a certified laboratory for processing as soon as possible. Additional water samples are to be collected as directed by the Manager of Development Permitting.

7. Call out vacuum trucks if required.
8. Coordinate company spill containment activities with appropriate agency on-scene manager (California Highway Patrol if spill incident is on a highway or public road and the U.S. Forest Service representative, if incident is off-highway on National Forest Service lands).
9. Direct repairs to the source of the spill at the earliest practical time and return as many company employees to their regular assignments as soon as possible to get the field back to normal operations.
10. Continue to work contract crews, equipment and vacuum trucks on cleanup as necessary until all possible impacts associated with spill incident have been mitigated to the fullest extent possible.
11. All emergency transfer of waste materials to or from any waste disposal site shall be recorded and reports submitted as soon as possible to the Manager of Development Permitting.
12. All press and other media inquiries are to be directed to the agency "on-scene" manager if appropriate and to the highest level of company supervision at the spill site who will be courteous, disclose only the obvious and refer media personnel to the Western Region Public Relations Manager, Kent Robertson (925-479-6635, for further handling).

#### D. Spill Containment Procedures

The desired course of action in spill incidents is listed below in descending order of importance. Personnel involved as to proper implementation of the plan must exercise judgment.

1. Control at Source of Spill

Shut off the source of the spill by any means available. This may include shutting a valve, shutting off a pump or plugging a leaking tank or vessel with a wooden bung, rag, sack, gel or any other makeshift devices normally found around a producing or drilling operation.

2. Containment of Spill

Isolate and contain the spill as quickly as possible. Most spills are small and can be easily contained with hand tools that are carried on all company trucks. If the

spill cannot be contained with hand tools, or if secondary containment facilities are in danger of failing, larger equipment will be brought in as appropriate.

a. Drilling Materials

Make temporary repair to waste disposal sump, pad site perimeter berm or other source location, and/or contain fluids with dikes. Spread straw, hay and absorbents to impede the flow of fluids and contain any oil and grease or other observed impurities. Call out vacuum trucks and cleanup and transfer all spilled liquids to another active waste disposal site or available tank(s).

b. Petroleum Products

Contain spill with available manpower and equipment by use of dikes and/or absorbents. Clean up used absorbents and place in temporary storage for transfer to an approved off-site waste disposal facility.

c. Hazardous Substances

In the event of a major liquid or solid spill of a hazardous substance the appropriate District Ranger office should be called. After-hours call **911**.

3. Spill Cleanup

Cleanup operations should be commenced as soon as containment has been accomplished and will be performed by either company personnel or the local fire department's HAZMAT team or a licensed clean-up contractor depending on the material, size of the spill and the resources available for response. Cleanup will depend on the nature of the spill but may range from absorbing the spilled product with soil and properly disposing of the soil, to picking up the product with small portable pumps and empty drums or utilizing vacuum trucks.

4. Repair of Damage and Return to Normal Operations

Upon completion of cleanup, the reason for the spill will be determined and remedial action will be taken to prevent future occurrences.

E. Notification Procedures and Responsibilities

1. Person in charge of operations causing spill incident or first person to arrive at scene of discharge of spill responsible for:
  - a. Immediate notification to on-duty Supervisor.
2. On-duty Supervisor Responsible for:
  - a. Immediate notification to the Development Permitting Manager providing communication is possible, otherwise:
  - b. Immediate notification to the Sheriff's Department/California Highway Patrol,  
**911\***

and



FIRE PLAN FOR CONSTRUCTION AND SERVICE CONTRACTS

(Attachment to Contract)

(Ref: FSH 6309.32 and 6309.11)

1. SCOPE

The provisions set forth below outline the channels of responsibility for fire prevention and suppression activities and establish an attack procedure for fires within the contract area. The contract area is delineated by map in the contract. The provisions set forth below also specify conditions under which contract activities will be curtailed or shut down. See Section 5, Emergency Measures below.

2. RESPONSIBILITIES

A. Contractor

(1) Shall abide by the requirements of this Fire Plan.

(2) Shall take all steps necessary to prevent his/her employees, subcontractors and their employees from setting fires not required in completion of the contract, shall be responsible for preventing the escape of fires set directly or indirectly as a result of contract operations, and shall extinguish all such fires which may escape.

(3) Shall complete the Contractor's Plan Regarding Personnel, Equipment and Organization (6.B) and shall furnish the Contracting Officer (CO) with a copy prior to commencing work at the site. Shall currently advise the CO of any changes in personnel, equipment and organization as the changes occur. Shall revise Section 6.B to reflect current activities upon request of the CO.

B. Forest Service

(1) District Ranger or Designated Representative

(a) Will inspect the contract to assure compliance with the requirements of the Fire Plan.

(b) Will notify CO in event of Contractor's noncompliance with the Fire Plan.

(2) Contracting Officer's Representative (COR)

(a) Will accompany District Ranger or representative on contract inspections for compliance with provisions of this Fire Plan.

(b) Will notify Contractor to correct any discrepancies with regard to the requirements of this Fire Plan.

### 3. TOOLS AND EQUIPMENT

A. The Contractor shall comply with the following requirements:

(1) Shall equip all diesel and/or gasoline-operated engines, both stationary and mobile, and all flues used in any contract and camp operations with spark arresters that meet Forest Service standards set forth in the National Coordinating Group publication for Multiposition Small Engines, #430-4, or General Purpose and Locomotive, #430-2. Spark arresters are not required on equipment powered by exhaust-driven turbo-charged engines or motor vehicles equipped with a maintained muffler as defined in California Public Resources Code (CPRC), Section 4442 and 4443.

(2) Shall furnish and have available for emergency use on each piece of equipment used in conjunction with performance of the work as listed below, hand tools and/or equipment as follows (CPRC 4427 and 4431):

(a) One shovel, one axe (or pulaski) and a fully charged fire extinguisher U.L. rated at 4 B:C or more on each truck, personnel vehicle, tractor, grader and other heavy equipment.

(b) One shovel and one back-pack 5 gallon (19 liters) water-filled tank with pump with each welder.

(c) One shovel and one chemical pressurized fire extinguisher (fully charged) for each gasoline-powered tool, including but not restricted to chain saws, soil augers, rock drills, etc. Fire extinguishers shall be of the type and size set forth in the California Public Resources Code Section 4431. Shovel must be kept within 100 feet (30 meters) of each chain saw when used off cleared landing areas.

(3) All tools and equipment required in (1) and (2) above shall be in good workable condition and shall meet the following principle Forest Service specifications for fire tools:

(a) Shovels shall be size "O" or larger and be not less than 46 inches (117 centimeters) in overall length.

(b) Axes (or pulaskis) shall have 2-1/2 pound (1.1 kilogram) or larger heads and be not less than 28 inches (71 centimeters) in overall length.

(4) In accordance with CPRC, Section 4428, Specific Fire Fighting Tools Required on Industrial Operations, a sealed box of tools shall be located within the operating area, at a point accessible in the event of fire. This fire tool box shall contain: one 5-gallon (19 liter), backpack pump-type fire extinguisher filled with water; two axes; two McLeod fire tools; one serviceable chain saw of three and one-half or more horsepower with a cutting bar 20 inches (51 centimeters) in length or longer; and sufficient number of shovels so that each employee at the operation can be equipped to fight fire. If so designated in Section 5.C, the Contractor shall make available this box of fire fighting tools for use at location(s) of the work. The fire tool box shall remain unlocked, but be sealed with Forest Service seal to be broken for emergency use only. If fire tool box is furnished by the Government (see Section 5.D), the contractor shall be responsible for its return to the Government. The cost of

replacing any shortage of tool inventory or damage to the box due to Contractor's negligence will be withheld from the final contract payment due Contractor.

(5) Shall furnish a water tank truck or trailer, if so designated in Section 5.F. Tank truck or trailer shall be located on or immediately adjacent to the contract area and meet the following minimum specifications: Contain at least 300 gallons (1137 liters) of water; a combination straight stream-fog nozzle with 300 feet (91 meters) of one inch (2.5 centimeter) fire hose with no segment longer than 50 feet (15 meters); fire hose with nozzle closed shall be capable of withstanding 200 psi pump pressure without leaking, slipping of couplings, distortions, or other failures; nozzle discharge rating of 6 to 20 gallons (23 to 76 liters) per minute; a pump capable of delivering 23 gallons (87 liters) per minute at 175 pounds psi at sea level; power unit for pump shall have fuel for at least two hours operation, with ample transport available for immediate and safe movement of tank over roads serving the contract area; and shall be in good working order; pump outlet shall be equipped with 1-1/2 inch (4 centimeter) National Standard Fire Hose thread.

(6) Shall furnish two tractor headlights for each tractor dozer, if so designated in Section 5.F. Tractor headlights shall be attachable to each tractor and served by an adequate power source.

B. Forest Service

(1) Contracting Officer's Representative (COR). Will deliver Government-furnished fire tool box to contract site and remove after completion and acceptance of the contract, if so designated in Section 5.D below.

4. GENERAL

A. State Law. The Contractor shall comply with all applicable laws of the State of California. In particular, see California Public Resource Codes.

B. Permits Required. The Contractor must secure a special written permit from the District Ranger or designated representative before engaging in any of the activities listed below. The terms and conditions of any of the permits required for this contract are as shown on copies attached to the Fire Plan.

(1) Blasting and Storage of Explosives and Detonators. (Explosives Permit required by California Health & Safety Code, Section 12101.)

(2) Burning.

(3) Air Pollution. (Issued by local State or County Air Pollution Control Districts, as applicable.)

(4) Camp, Lunch and Warming Fires.

(5) Welding and Cutting.

C. Regulations for Burning. Before setting any fires whatsoever, the Contractor shall notify the CO of his/her intentions. Special care shall be taken to prevent scorching or causing any damage to adjacent structures, trees, and shrubbery. Piles of material to be burned shall be of such size and so placed that during burning no damage shall result to adjacent objects.

D. Smoking and Fire Rules. Smoking shall not be permitted during fire season, except in a barren area or in an area cleared to mineral soil at least 3 feet (0.9 meters) in diameter (CPRC 4423.4). In areas closed to smoking, the CO may approve special areas to be used for smoking. These areas shall be signed by the Contractor.

Contractor shall post signs regarding smoking and fire rules in conspicuous places for all employees to see. Contractor's supervisory personnel shall require compliance with these rules. Under no circumstances shall smoking be permitted during fire season while employees are operating light or heavy equipment, or walking or working in grass and wood lands.

E. Storage and Parking Areas. Equipment service areas, parking areas, and gas and oil storage areas shall be cleared of all inflammable material for a radius of at least 50 feet (15 meters). Small mobile or stationary engine sites shall be cleared of inflammable material for a radius of at least 15 feet (4.6 meters) from such engine. Areas of the type described above must be approved in writing by the CO.

F. Welding. Contractor shall confine welding activity to cleared areas having a minimum radius of ten feet measured from place of welding.

G. Blasting. Contractor shall use electric caps only. When blasting is necessary in slash areas, a watchperson equipped with shovel and a water-filled backpack can (5 gallon or 19 liter) with hand pump shall remain in the immediate area for an hour after blasting has been completed.

H. Oil Filter and Glass Jugs. Contractor shall remove from National Forest land all oily rags and used oil filters. Contractor shall prohibit use of glass bottles and jugs on contract operations.

I. Reporting Fires. As soon as feasible after initial control action is taken, Contractor shall notify Forest Service of any fires along roads used by Contractor.

J. Communications. If required in Section 5.I of these Fire Plan Requirements, Contractor shall furnish a serviceable telephone, radio-telephone, or radio system connecting each construction operation with Contractor's headquarters. A radio-equipped fire patrolperson vehicle will satisfy this requirement if in operation during the time required. When such headquarters is at a location which makes communication to it clearly impractical, the Forest Service will accept a reasonable alternative location. The communication system shall provide prompt and reliable communications between Contractor's headquarters (or above stated alternative) and Forest Service via commercial or Forest Service telephone. The communications system shall be operable during Contractor's operation in the fire precautionary period and at the time fire patrolperson service is required.

## 5. EMERGENCY MEASURES

An Activity Level based on conditions in the contract area or a comparable rating area has been established.

A. The Contractor shall curtail operations to the extent shown below. If Activity Level is determined by measurements taken at a Contractor-installed weather station within the contract

area, curtailments shall take effect immediately. If no fire weather station is installed, limitations or requirements will be determined by the Predicted Activity Level made the preceding afternoon, subject to revision if Actual Activity Level is greater than that predicted.

Activity Level	Limitations or Requirements For Next Day Based on Predicted Activity Level or When Actual Activity Level Is Measured
(1)	<u>Minimum required by state law.</u>
(2)	<u>When the Activity Level shown under 5.B.2 of this Fire Plan is met or exceeded:</u> In addition to complying with the limitations and requirements for the preceding level, the Contractor shall: Furnish fire patrolperson (if required under 5.D below). Furnish tank truck or trailer (if required under 5.E below).
(3)	<u>When the Activity Level shown under 5.B.3 of this Fire Plan is met or exceeded:</u> In addition to complying with the limitations and requirements shown for the preceding levels, the Contractor shall: Stop all snag falling. Recently-killed or dead trees (such as bug trees) are not considered snags; the felling of these may continue as determined by the CO.
(4)	<u>When the Activity Level shown under 5.B.4 of this Fire Plan is met or exceeded:</u> In addition to complying with the limitations and requirements shown for the preceding levels, the Contractor shall: Stop all falling, limbing, bucking, skidding and other clearing and grubbing operations at 1:00 p.m. (local time). Welding only by special permit. No blasting after 10:00 a.m. Open burning of any kind shall not be permitted at any time during the day.
(5)	<u>When the Activity Level shown under 5.B.5 of this Fire Plan is met or exceeded:</u> In addition to complying with the limitations and requirements shown for the preceding levels, the Contractor shall: Shut down all operations except as specifically permitted by written order of CO. No welding, burning or blasting of any kind shall be permitted. Roads may be watered, or dust oiled (does not include pit development). Equipment at landings may be serviced. Work in nonhazardous areas may continue if specifically permitted by written order of CO.

The above requirements are cumulative and are tied directly to the Activity level as it is predicted for each day. Lightning storm predictions will not be used as a basis for these requirements. The Contractor can obtain the Predicted Activity level for the following day at telephone number (530) 493-2243 for the West Side, and (530) 398-4391 for the East Side, after 4:00 p.m. daily (during business hours).

A review of the Actual Activity Level will be made daily. If the Actual Activity Level exceeds the Predicted Activity Level given the previous day, the Contractor will be notified if work activity is to be curtailed based on the Actual Activity level.

B. The following are averages of predicted and actually attained Activity Levels at the Oak Knoll weather station during the period of 5/1/98 to 9/30/98 . These averages are based on 1 year of records. For the East Side levels, the following averages of predicted and actually attained levels were obtained at the Goosenest weather station during the period of 5/1/98 to 09/30/98. These averages are based on 1 year of records.

Activity Level	West Side		East Side	
	Days Predicted	Days Attained	Days Predicted	Days Attained
1	*	*	*	*
2	*	*	*	*
3	*	*	*	*
4	*	*	*	*
5	*	*	*	*

**\* (See attached Sale Activity Levels - 2000)**

C. The Contractor (  ) will (  ) will not be required to furnish box of fire fighting tools.

D. The Forest Service (  ) will (  ) will not furnish box of fire fighting tools.

E. The Contractor (  ) will (  ) will not be required to furnish a fire patrol person to prevent, detect, and suppress any fires in the contract area. The patrolperson shall remain on duty at least two hours after the close of work.

F. The Contractor (  ) will (  ) will not be required to furnish a water tank truck or trailer. Water tank truck or trailer (  ) may (  ) may not be used for other work on the contract.

G. The Contractor (  ) will (  ) will not be required to furnish tractor headlights.

H. The Contractor (  ) may (  ) may not install a fire weather station on contract area for obtaining Activity level records in lieu of those listed in 5.B. The Forest Service shall designate the fire weather station location. Instruments needed to obtain Activity level shall meet specifications and standards in "Fire Weather Observers Handbook" which is available for inspection in the District Ranger's Office. Observations shall be taken at 1:00 p.m. daily as a minimum. When Activity Level 3 or above is reached, additional observations shall be made at 2-hour intervals, beginning not later than 11:00 a.m. Emergency precautions for the measured Activity level shall be implemented. Records of weather measurements shall be maintained and shall be available to the Forest Service on request.

I. The Contractor (  ) will (  ) will not be required to furnish communications equipment.

J. The appropriate fuel model(s) for this project is (are) G for West and East Side (See Activity Level schedules included in this contract).

JUNE	WEST			EAST		
	PREDICTED SAL	ACTUAL SAL	NUMBER OF TIMES	PREDICTED SAL	ACTUAL SAL	NUMBER OF TIMES
	1	1	7	1	1	6
	1	2	1	1	2	3
	1	3	2	1	3	2
	2	1	1	2	1	1
	2	2	4	2	2	2
	2	3	3	2	3	4
	2	4	1	2	4	1
	3	1	1	3	1	4
	3	2	3	3	2	2
	3	3	8	3	3	3
	3	4	0	3	4	1
	4	1	0	4	1	0
	4	2	0	4	2	0
	4	3	0	4	3	1

JULY	WEST			EAST		
	PREDICTED SAL	ACTUAL SAL	NUMBER OF TIMES	PREDICTED SAL	ACTUAL SAL	NUMBER OF TIMES
	1	1	6	1	1	6
	1	2	1	1	2	3
	1	3	2	1	3	2
	1	4	0	1	4	1
	2	1	1	2	1	1
	2	2	2	2	2	2
	2	3	6	2	3	4
	3	1	0	3	1	4
	3	2	2	3	2	2
	3	3	11	3	3	3
	3	4	0	3	4	1
	4	3	0	4	3	1

**UGUST**

<b>WEST</b>			<b>EAST</b>		
<b>PREDICTED SAL</b>	<b>ACTUAL SAL</b>	<b>NUMBER OF TIMES</b>	<b>PREDICTED SAL</b>	<b>ACTUAL SAL</b>	<b>NUMBER OF TIMES</b>
1	1	0	1	1	0
1	2	0	1	2	1
1	3	0	1	3	0
2	1	0	2	1	0
2	2	0	2	2	0
2	3	2	2	3	3
3	1	0	3	1	1
3	2	1	3	2	5
3	3	26	3	3	18
3	4	1	3	4	1
4	3	1	4	3	1
4	4	1	4	4	0
5	3	1	5	3	1

**SEPTEMBER**

<b>WEST</b>			<b>EAST</b>		
<b>PREDICTED SAL</b>	<b>ACTUAL SAL</b>	<b>NUMBER OF TIMES</b>	<b>PREDICTED SAL</b>	<b>ACTUAL SAL</b>	<b>NUMBER OF TIMES</b>
1	1	12	1	1	15
1	2	3	1	2	3
1	3	0	1	3	0
2	1	1	2	1	5
2	2	5	2	2	4
2	3	3	2	3	0
3	1	3	2	4	0
3	2	0	3	1	0
3	3	3	3	2	1
3	3	2	3	3	2

CTOBER	WEST			EAST		
	PREDICTED SAL	ACTUAL SAL	NUMBER OF TIMES	PREDICTED SAL	ACTUAL SAL	NUMBER OF TIMES
	1	1	26	1	1	26
	1	2	0	1	2	1
	1	3	0	1	3	0
	2	1	0	2	1	0
	2	2	1	2	2	0
	2	3	0	2	3	1
	3	1	0	3	1	0
	3	2	0	3	2	0
	3	3	4	3	3	3

6. REPORTING ALL WILD FIRES

A. Contractor's employees shall report all fires to any of the following Forest Service facilities and/or personnel listed below, but not necessarily in the order shown:

	<u>Name</u>	<u>Office Address and/or telephone</u>	<u>Home address and/or telephone</u>
Nearest Forest Service Station	Goosenest R.D.	530-398-4391	

Inspector \_\_\_\_\_

Contracting Officer's

Representative      Jim Stout      530-398-4391

District Ranger \_\_\_\_\_

D.R. Designated

Representative \_\_\_\_\_

B. Contractor's Plan Regarding Personnel, Equipment and Organization. The Contractor shall, prior to commencing work, furnish the following information relating to key personnel, tools and equipment available for the purpose of fighting wild fires within and adjacent to the Contract Area:

**This information will be coordinated and supplied to Jim Stout during mobilization operations.**

<u>Title</u>	<u>Name</u>	<u>Address and/or Telephone</u>

(2) Personnel and Equipment

	<u>Number</u>	<u>Classification or Type, Make and Model</u>
<u>Fire Fighters:</u>		

<u>Fallers:</u>		

<u>Power Saws:</u>		

<u>Other Equipment:</u>		

(3) Remarks: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
Contractors's Signature

\_\_\_\_\_  
Date

**ORDER NO. 01-05-523**  
***KLAMATH NATIONAL FOREST***

**FIRE RESTRICTIONS**

Pursuant to 36 CFR 261.50(a) and (b), and due to fire danger, the following acts are prohibited within the Klamath National Forest. This order is effective beginning June 29, 2001, and continuing through October 31, 2001.

1. Building, maintaining, attending or using a fire or campfire, or stove fire except in the designated recreation sites shown in Exhibit A. Persons with a valid California Campfire Permit, are not prohibited from using a portable stove or lantern gas, jellied petroleum, or pressurized liquid fuel. 36 CFR 261.52(a).
2. Smoking, except within an enclosed vehicle or building, or in the designated recreation sites shown in Exhibit A. 36 CFR 261.52(d).
3. Welding, or operating an acetylene or other torch with an open flame. 36 CFR 261.52(i).
4. Using an explosive. 36 CFR 261.52(b).
5. Operating an internal combustion engine, except on a forest development road or a forest development trail. 36 CFR 261.52(h).

Pursuant to 36 CFR 261.50(e), the following persons are exempt from this order:

1. Persons with a permit specifically authorizing the otherwise prohibited act or omission.
2. Any Federal, State, or local officer, or member of an organized rescue or fire fighting force in the performance of an official duty.

These prohibitions are in addition to the general prohibitions in 36 CFR Part 261, Subpart A.

Done at Yreka, California on \_\_\_\_\_ day of June, 2001.

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MARGARET J. BOLAND  
Forest Supervisor  
Klamath National Forest

Violation of these prohibitions is punishable by a fine of not more than \$5,000 for an individual or \$10,000 for an organization, or imprisonment for not more than six months, or both. 16 USC 551 and 18 USC 3559 and 3571.

**EXHIBIT A**  
**Forest Order No. 01-05-523**  
**Klamath National Forest**

**DESIGNATED RECREATION SITES**

<b>GOOSENEST</b>	<b>SCOTT RIVER</b>
Juanita Lake Campground	Beaver Creek Campground
Martin's Diary Campground	Jones Beach Picnic Area
Shafter Campground	Brown Bear Picnic Area
Four Corners Snowmobile Park	Cayuse Picnic Area
Deer Mtn Snowmobile Park	Skeahans Bar Picnic Area
Orr Lake Campground	Tree of Heaven Campground
	Kangaroo Lake Campground & Picnic Area
<b>HAPPY CAMP</b>	Bridge Flat Campground
Curly Jack Campground	Mt. Ashland Campground
Sulphur Springs Campground	Grouse Gap Shelter
West Branch Campground	Trail Creek Campground
Fort Goff Campground	Indian Scotty Campground
Nor Cross Campground	Carter Meadows Group Campground
Grider Creek Campground	Kangaroo Lake Campground & Picnic Area
O'Neil Creek Campground	Lover's Camp Trailhead
Sarah Totten Campground	Hidden Horse Campground
Kelly Lake Campground	
Poker Flat Campground	
<b>SALMON RIVER</b>	
Big Flat Campground	
East Fork Campground	
Hotelling Campground	
Idlewild Campground	
Little North Fork Campground	
Matthews Creek Campground	
Mulebridge Trailhead	
Red Bank Campground	
Shadow Creek Campground	
Bacon Rind Campground	

